



Application of Project Based Learning Model to Improve Learning Outcomes of Grade IV Students in State Elementary School 1 Dukuhmaja

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Abstract. This Research aims for increasing of learn result at second grade SDN 1 Dukuhmaja which has twenty-five students on parts of plants and their functions material with teacher's effort on planning and doing teaching-learning process using Project Based Learning model. It because of class condition with the problems (1) learn result of Social Sciences was low specifically in parts of plants and their functions material with classical mastery 48,2 %, (2) low of using variation on method and model in teaching, (3) limited for availability of media, tools and infrastructure which support learning process. Based on the research obtains learn result from student's comprehension in first cycle classical mastery get 65,8% with fifteen students completed and ten students uncompleted. In second cycle, classical mastery reaches 100 % with twenty-five students completed. As for measuring teacher's skills for planning in first cycle get 3,3 score and 3,8 score in second cycle with really goes category. While for doing teaching learning process in first cycle get 3,5 score and second cycle get 3,8 with really good category. This research projecting in order that implementation of Project Based Learning model in classroom action research should pay attention in each step and increase so many references for used in learning.

Keywords: learning, problem-based learning, learn result

INTRODUCTION

The curriculum is one of the most important elements in the implementation of the learning process at all levels of education. The curriculum is very necessary to prepare learning programs that are in accordance with the expected targets. (Vienna Roza, 2022) suggests the curriculum as a set of guidelines designed in a learning program carried out. Therefore, the curriculum is always changing to adapt to changing times and the needs and conditions of students that aim to improve the quality and quality of education in a country, including the improvement of the 2013 curriculum into an independent curriculum.

The independent curriculum is an effort by the Indonesian government to develop and train the competencies or skills of students. Unlike the 2013 curriculum which uses integrated thematic based learning where each subject is interrelated and tied in one theme,

the independent curriculum simplifies content and focuses on essential material. One of the content updates in the independent curriculum is the merger of science and social studies subjects into Natural and Social Sciences (IPAS). Characteristics of learning. IPAS is 1) the integration of subjects between science and social studies into IPAS, 2) active and collaborative learning, 3) problem-based learning, 4) inclusive approaches, and 5) the use of diverse learning resources. Learning is a process of interaction between students and educators with a variety of activities that are deliberately designed so that students can have abilities in accordance with curriculum standards both in terms of cognitive, affective and psychomotor (Djamaluddin & Wardana, 2019).

The learning process should take place interactively, inspirationally, fun, challenging, motivate students to participate actively, and provide sufficient space for initiative, creativity, and independence in accordance with the talents and interests of students (Nurdyansyah, 2018). The learning process must involve many parties, which are balanced by technological developments to facilitate the achievement of a certain atmosphere in the learning process so that students are comfortable in learning. Before carrying out the learning process, teachers need to make a learning plan in the form of teaching modules. According to Utami Maulida (2022), teaching modules are learning materials that are arranged extensively and systematically with reference to learning principles applied by teachers to students. Systematically can be interpreted in order starting from the opening, content of the material, and closing so that it makes it easier for students to learn and makes it easier for teachers to deliver material. The independent curriculum teaching module refers to a number of media tools or suggestions, methods, instructions, and guidelines in a systematic, interesting, and in accordance with the needs of students.

Low learning outcomes of students are influenced by various factors. This encourages teachers to be able to make changes and compile learning designs that are in accordance with the characteristics of students. As for the learning conditions in grade IV SDN 1 Dukuhmaja, researchers found several gaps that showed (1) low learning outcomes in science learning material of plant parts and function with classical completeness as much as 48.2% with 15 students meeting the KKM scores and 10 students not yet completed, (2) the lack of variation in the use of methods and models in teaching tends to use one source book which is a companion book for students, and (3) limited availability of media and facilities and infrastructure that support the learning process, (4) project results in science learning have not been seen, (5) lack of active interaction between teachers and students. This condition

encourages researchers to be able to make efforts to improve learning outcomes by making students the center of learning.

These problems have an impact on aspects of students, namely: 1) students tend to be passive because the learning process is teacher-centered, 2) lack of student initiative during the learning process, 3) students are less motivated in learning, 4) students are not used to working together in groups, 5) low learning outcomes of students. Problems that arise when making observations in class IV with the desired expectations in science learning, efforts are needed to improve learning outcomes in class IV. The selection of the right teaching model is a solution so that all students participate in learning activities. Teachers not only deliver the material thoroughly but also make changes that exist in students. This is in accordance with learning in the independent curriculum which refers to the Pancasila Student Profile, that students need to be trained to be able to reason critically, and creatively. (Malikah, et al. 2022).

According to Muhajarah & Rachmawati (2019) stated in the results of their research that the absorption ability of each student in learning is influenced by learning experience, mode, modality and learning style. This is in accordance with Edgar Dale's theory which shows that being involved / experiencing directly has the highest presentation to be able to invite students to be involved mentally, physically, emotionally and also intellectually systematically (Gani Ali, 2014). Therefore, to solve the gap that occurs, researchers need to pay attention to the characteristics of students. One of the efforts made is to detect the learning modalities of students in the classroom which get a percentage of 82% have kinesthetic learning modalities. Thus, researchers design learning steps to be able to accommodate the gaps that have been described by the application of a learning model, namely the Project Based Learning (PjBL) model.

In order for students to learn more actively, reason critically, and be able to work together in the special learning process of IPAS, they can use a project-based learning model or commonly called PjBL. The PjBL learning model is a learning model designed to overcome the learning difficulties of students individually and in groups, making students accustomed to working together, thinking critically, helping each other towards students who do not understand the lesson, and produce a project that is able to help students in the learning process. Project-based learning or PjBL is a learning model that provides opportunities for teachers to manage learning in the classroom by involving project performance. In addition, Project Based Learning engages students in problem-solving activities and other meaningful

activities, giving students the opportunity to work independently in the learning process, and ultimately students produce valuable and realistic student work products.

Based on this, researchers are interested in being able to apply the PjBL model as an effort made to improve student learning outcomes in science learning plant parts and their functions in class IV. Therefore, the researcher took the title "Application of Project Based Learning Model to Improve Learning Outcomes of Grade IV Students at SDN 1 Dukuhmaja". This research is expected to measure the ability of teachers to plan and implement learning and help in improving learning outcomes that pay attention to the characteristic conditions of students.

LITERATURE

Education today emphasizes life skills, learning focuses on skills, and the hope is to produce valuable results. This requires a rich and tangible learning environment that covers various aspects of competence. These learning environments should create real-life relevant situations, content, and tasks, consider primary data sources to ensure authenticity, and encourage the development of life skills through social interaction and personal experience. These skills are placed in an individual context and are influenced by social collaboration and experience. The learning process also takes into account previous knowledge, beliefs, and attitudes, putting forward problem-solving skills and deep understanding. Learners are encouraged to learn through practical experience that adds complexity to tasks and skills. The complexity of knowledge is emphasized through learning that highlights conceptual connectedness and cross-disciplinary approaches. Collaboration and cooperative learning are emphasized to introduce alternative views to learners. In addition, the measurements used are authentic and are an integral part of the learning process (Murniarti, 2016).

Taking into account its unique and comprehensive characteristics, the Project-Based Learning method has enough potential to meet (Murniarti, 2016). The Project Based Learning model can improve student learning outcomes with an average score before the Project Based Learning model of 63.29 can increase by 16.85 to 80.15 (Fahrezi and Taufiq, 2020). The results of other studies also state that learning outcomes using the Project Based Learning method are higher than using the practice method of learning demands (Amini, 2015). The Project Based Learning method is one of the student-centered methods (Lailatunnahar, 2021). Project-Based Learning is a learning method that engages students in practical and substantial projects. Students work in groups or individually to complete real

projects that require the application of their knowledge and skills. In PBL, students not only acquire theoretical knowledge, but also learn how to tackle real problems, work in teams, communicate effectively, and develop problem-solving skills (Fathurrohman, 2016).

METHOD

The method used is collaborative Classroom Action Research (PTK) with civil service teachers as collaborators. PTK has an important role in strategies to improve the quality of learning if implemented properly and correctly so as to form a culture learning for teachers to be able to evaluate and reflect on the learning process that has been implemented (Kunandar, 2013). PTK is a real-world practice intervention aimed at improving practical situations. PTK aims to be able to improve and or overcome problems both about learning, personal and social problems experienced by students which were found before the study.

According to Arikonto (2013) stated that PTK activities include four steps, namely planning, implementation, observation and reflection. The description is as follows: (1) planning is carried out before conducting research including identification, analysis, problem formulation, formulation of action hypotheses to preparation for implementation, (2) implementation is part of the realization of the plan as well as observation, (3) observation to be able to observe any changes that occur in students during the learning process to obtain facts that can be used at the next stage, and (4) reflection is analysis, synthesis, interpretation, explanation to conclusion activities (Sukardiyono, 2015). The applied PBL syntax consists of six stages, namely 1) determining the main question or problem 2) planning the project 3) creating a project completion schedule 4) monitoring the progress of project completion 5) presenting and testing the results of project completion. 6) evaluate and reflect on project processes and results (Trimawati, 2020).

In its implementation, researchers use 2 cycles, namely 4 meetings and 2 data collection starting from July to completion. This research was carried out in July-August 2023 at SDN 1 Dukuhmaja Class IV with 25 students, 13 men and 12 women. The reason for taking this place as a place of research is because this place is a place for PPL II researchers during their time as Pre-service PPG students. We also build a good relationship with the school, making it easier to find data. Quite a lot of time makes it easier for us in research activities, and between the residence of researchers and research places that are quite close. The data collection techniques used are observation, documentation studies, and tests. So that the research instruments used are observation sheets for the design of learning

devices, observation sheets for learning implementation, documentation study sheets on learning tools used before, and test questions. The data processing techniques, namely by triangulating data and rolling the classification of percentage descriptions, can be seen in table 1.

Table 1. Category Classification Interval

No.	Interval (P)	Score Weighting	Scale Likert
1.	Very decent/excellent/Totally agree	80-100%	4
2.	Decent/Good/Agree	66-79%	3
3.	Less Decent/ Less Good/ Less Agree	56-65%	2
4.	Not Worthy/ Not Good/ Disagree	0-55%	1

(Source: Ratnasari et al., 2020; Sugiyono, 2019)

The score weight calculation formula is calculated using the following formula:

$$P = \frac{S}{N} \times 100 \%$$

Information:

P = Sub variable percentage

S = Number of total scores of sub variables

N = Maximum total score count

As for the measurement of learning completeness in class, according to Trianto (in Royani, 2017), a class is said to be complete learning (classical completeness) if in that class there are $\geq 85\%$ of students who have completed learning. Therefore, improving learning outcomes using PjBL requires achieving classical completeness of $\geq 85\%$ of students who have completed it to be successful. So that individual success indicators with a minimum score of 70 and classical $\geq 85\%$.

DISCUSSION

This research was carried out in the form of classroom action research with two cycles which included measuring the teacher's ability to plan and implement learning and measuring student learning outcomes after using the PjBL model to improve student learning outcomes in learning science material (Plant Parts and Their Functions). After observing the implementation of classroom learning on Thursday, July 27, 2023, it was found that the learning results in the pre-cycle showed a classical completeness presentation of 48.2% with 15 students who were complete, and 10 students who were not complete. Researchers arrange learning designs according to learning syntax. Cycle I will be held on Friday, August 4, 2023 and cycle II will be held on Monday, August 7, 2023.

The results of the assessment of the teacher's ability to plan using the observation sheet format of the instrument lesson study are shown in table 2. Based on table 2, it can be

seen that the teacher's ability in cycle I obtained a score of 3.3 and cycle II obtained a score of 3.8. The difference in score obtained is 0.5. This average score falls into the excellent category. Meanwhile, the results of research on the ability of teachers to carry out learning can be seen in table 3 which shows that the teacher's ability to carry out learning has received a graded score with three aspects including the beginning, core and closing activities in learning. Cycle I obtained an average score of 3.5 and cycle II received a score of 3.8. There is a score difference of 0.3 This score falls into the very good category. The acquisition of learning outcomes from the learning process shows that in the first cycle of classical completeness obtained a percentage of 65.8% with a grade average of 77.5 which reached a minimum average. However, its classical completeness has not reached the predetermined standard. The composition is 15 students complete and 10 students incomplete. While in cycle II classical completeness reaches 100% with all students complete with an average score of 90.5 as shown in table 4.

Table 2. Results of Observation of Teacher Ability in Learning Planning

No.	Observed aspects	Cycle	
		Cycle I	Cycle II
1.	Minimum Component Completeness	3	4
2.	Essential and Meaningful	4	4
3.	Continuous	3	3
4.	Contextual	4	4
5.	Simple	3	4
6.	Supporting Components	3	4
Score Total		21	23
Average Score		3,3	3,8

Table 3. Observation of Teachers' Ability to Carry Out Learning

No.	Observed aspects	Cycle	
		Cycle I	Cycle II
1.	Initial Activities:		
	- Perception &; Motivation	3	4
2.	Core Activities:		
	- Suitability of Teaching Materials	3	4
	- Source/Media Management	4	4
	- Learning Strategy	4	4
3.	Concluding Activities:		
	- Evaluation	3	3
	- Reflex	4	4
Score Total		21	23
Average Score		3,5	3,8

Table 4. Recapitulation of Learning Outcomes

No	Observed Aspects	Cycle I	Cycle II
1.	Number of Students	25	25
2.	Number of Values	900	1.020
3.	KKM	75	75
4.	Average rating	77,5	90,5

5.	Lowest Value	50	80
6.	Top Rated	90	100
7.	Number of Students Complete	15	25
8.	The Number of Students Has Not Been Completed	10	0
9.	Average Percentage of Completeness	65,8%	100%
10.	Category	Not Good	Excellent

Based on observations on pre-cycle activities, researchers plan according to gaps that have arisen. Research activities that have been carried out with collaborators for two cycles show the results of teachers' ability to plan and implement learning and the acquisition of learning outcomes in understanding fractional number material learning. Researchers as grade IV teachers conduct learning planning using the PjBL model which has 6 learning syntax. This encourages researchers to elaborate learning steps by integrating the characteristics of students, the use of media and the achievement of learning objectives to make students actively involved in thinking mentally and physically. One of them is by accommodating the learning profile of students who are dominated by kinesthetics as much as 88% so that the percentage of activities is adjusted so that students are able to experience directly.

In the first cycle, researchers prepare a plan with learning tools that contain the following aspects: completeness of minimum components, essential and meaningful, continuous, contextual, simple and supporting components. So that the application of PjBL is adjusted to these aspects, the following is the description: (1) the preparation of teaching modules by containing the completeness of minimum components and supporting components, (2) the use of interactive media with the TPACK approach to fulfill essential and meaningful aspects, and (3) learning steps are arranged based on problems commonly found daily by students related to the theme of togetherness to contain contextual aspects, continuous and simple.

In the application of PjBL, researchers pay attention to the learning syntax of the predetermined model. The description is that in phase 1 determine the main question or problem, namely students are asked to observe and listen to learning videos and then answer questions from teachers about plant parts contained in learning videos. In phase 2 of planning the project, the teacher divides students into 5 groups according to their learning style, then students and their groups are asked to pay attention to the teacher's explanation of instructions or instructions in working on LKPD. In phase 3, making a project completion schedule is that students arrange the distribution of tasks with their groups, then the teacher provides time direction for project activities to be carried out. In phase 4, monitor the

progress of project completion, where students make projects with their groups, then teachers monitor student involvement during the discussion process and go around each group and provide assistance to groups that have difficulties. In phase 5 presenting and testing the results of project completion, students present the work of the group, then the teacher guides the presentation and invites other groups to give responses. In addition, the teacher also gave appreciation to each group that had advanced. In phase 6 evaluating and reflecting on the process and results of the project, the teacher provides reinforcement from the results of the group presentation, then the teacher gives evaluation questions to students. After that, the teacher and students conclude the learning and reflect on the learning that has been carried out.

Furthermore, in the ability to carry out learning, there are several aspects that teachers pay attention to, which include the ability in the beginning, core and closing activities. Researchers conduct perception when starting learning with questions that are the initial conditioning in science learning. As has been described, IPAS is a learning that presents a context that is relevant to natural conditions and the environment around students. It aims to provide contextual and meaningful things for students. In the core activities, researchers deliver teaching materials, measure the effectiveness of media use and learning strategies in dealing with students. According to collaborators, the preparation of teaching materials both explained and contained in LKPD is considered insufficient to build student understanding. Therefore, this is a record for researchers to be able to increase it in the next cycle. As for the closing activity, researchers conduct evaluations and reflections to measure the ability of students after following the learning process.

The implementation of learning in the first cycle is carried out simultaneously with observations of things that arise in the process of implementing PjBL as a stage in PTK. Students are enthusiastic and eager enough to be able to follow the learning process. This is shown by learners being able to answer perceptions alternately and share tasks and roles in groups. Researchers provide opportunities for each student to be actively involved in learning. In role sharing activities, students are conditioned to be able to have their respective roles guided by LKPD. The score obtained from the teacher's ability device in the solution contained in the design of the learning tool in the first cycle was 3.8 with a very good category. As for the ability to carry out learning, it gets a score of 3.5 which falls into the good category. The acquisition of learning outcomes to measure understanding has classical completeness of 65.8% with an average score of 77.5. The classification of learning

outcomes is included in the category of poor even though the average class has reached KKM. Therefore, researchers need to reflect and compile follow-up plans to improve the processes that have been implemented in cycle I.

Before carrying out cycle II, researchers reflect that there are various gaps that arise in students, so researchers and collaborators make conclusions and agreements as a form of reflection and follow-up plans for the next cycle. The conclusions and agreements on the learning process from cycle I, namely (a) in the learning planning process, teachers are considered to be able to plan learning well, (b) in the implementation process, teachers already have good abilities to carry out learning. However, students are not used to being the center of learning. (c) the ability of teachers to compile material in LKPD is still not good, so there needs to be improvements to be able to increase student understanding, (d) students are able to work in groups with the division of roles first to increase the effectiveness of cooperation attitudes in groups so that there is a need for a behavior modification approach during the learning process, (e) the use of media is attractive to students, However, students still feel hesitant when answering the questions given and show that there is still low understanding of students.

CONCLUSION

Based on the results of research that has been conducted for two cycles, it can be concluded that: (1) the ability of teachers to plan learning using the PjBL model increased from the measurement of cycle I which is 3.3 and cycle II which is 3.8. The difference in score obtained is 0.5 and the teacher's ability score is already in the very good category. (2) the ability of teachers to carry out learning using the PJBL model also increased from cycle I with a score of 3.5 and cycle II to 3.8. The score difference is 0.3 which is a very good category. (3) the learning outcomes of science learning about plant parts and their functions in class IV have increased with the previous classical completeness of 65.8% to 100%.

This shows that classroom action research that has been carried out by applying the PJBL model has succeeded in improving teacher abilities and learning outcomes of students. For this reason, suggestions from research that have been carried out for teachers as researchers in implementing PJBL in the classroom, namely paying attention to each stage in PTK to get success from the gaps that occur and multiply references in the learning process. In addition, problem solving in PTK will provide new knowledge and experience on teacher competence.

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